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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,399	12/17/2001	Ai Quoc Pham	IL-10824	4886

7590 06/05/2006  
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EXAMINER
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CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/025,399

Applicant(s)

PHAM ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. In response to the amendment received March 20, 2006:
  - a. Claims 1, 2 and 7 are pending;
  - b. The prior art rejections of record are withdrawn in light of the amendment.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 198 36 132 A1 (DE '132) in view of EP '356, Kuo and Weber, of record and U.S. Patent No. 5,500,307 (Anzai).

DE '132 discloses a solid oxide fuel cell comprising an anode, an oxygen ion conducting electrolyte (col. 2, ll. 28-44) a doped-ceria layer between the electrolyte and cathode (abstract) and a cathode including at least one lanthanum perovskite mixed metal oxide which includes elements such as cobalt, iron and manganese.

The differences between claims 1 and 7 and DE '132 is that DE '132 does not teach of a porous samaria-doped ceria/NiO anode (claims 1 and 2), of a ceria based electrolyte, of the particular cathode material (claims 1 and 7).

With respect to the anode material being a samaria-doped ceria anode (claim 1):

Anzai recognized that a porous anode comprising NiO, samaria and ceria is well known in the SOFC art (see col. 5).

The motivation for using the anode material of Anzai is that it provides improved reforming and catalytic activity at the anode site of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of DE '132 by selecting the anode material to comprise NiO, samaria and ceria since it would have provided an anode having improved reforming and catalytic activity. The selection of a known

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material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP 2144.07.

With respect to the electrolyte containing doped ceria (claim 1):

The electrolyte of DE '132 may appear to be YSZ (yttria stabilized zirconia) or EP '356 discloses that doped ceria electrolytes ( $\text{CeO}_2$  doped with materials such as  $\text{CaO}$  or  $\text{Gd}_2\text{O}_3$ ) compared to zirconia based electrolytes are preferable since they exhibit higher conductivity than the zirconia based electrolytes and can be operated at lower temperatures (page 3, ll. 42-45).

The motivation for using doped-ceria electrolyte is that it would have improved the conductivity of the electrolyte and further reduced the operating temperature of the SOFC.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of DE '132 by using doped-ceria electrolyte since it would have improved the conductivity of the electrolyte and further reduced the operating temperature of the SOFC. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP 2144.07.

With respect to the cathode containing cobalt iron manganese based material (claims 1 and 7):

The cathode material is desirably a perovskite structure ( $ABO_3$ ). It is well known in the art to provide air electrodes (cathodes) having a perovskite-like crystal structure of the formula  $ABO_3$ , wherein the A-site comprises a combination of a mixed lanthanide and multiple A-site dopants, and the B-site comprises a combination of Mn and at least one B-site dopant. The mixed lanthanide preferably comprises La, Ce, Pr and, optionally, Nd. The A-site dopants include at least one rare earth element selected from La, Ce, Pr, Nd, Sm, Eu and Gd, and at least one alkaline earth element selected from Ca, Sr and Ba. The B-site dopant is selected from Mg, Al, Cr, Ni, Co, Fe and combinations thereof (see abstract and col. 2, ll. 50-61 of Kuo). Weber further teaches that the perovskite cathode material is selected from combinations of A-site dopants of (La,Sr,Ca) and combinations of B-site dopants of (Cr, Mn, Fe, Co, Ni) (page 5) and that the particular dopant combinations can be adjusted and varied to optimize the thermal coefficient of expansion resulting in delamination at the cathode/electrolyte interface.

Any combination of these materials would have been obvious to one of ordinary skill in the art to while providing a cathode having a coefficient of thermal expansion which closely matches the other components of the fuel cell and decreasing the internal resistance of the fuel cell.

The motivation for using a cathode of La-Sr-Co-Fe-Mn-Oa in a fuel cell is that it would have provided an air cathode of a perovskite crystal structure which decreases

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the internal resistance of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of DE '132 by selecting the cathode material to be La-Sr-Co-Fe-Mn-Oa in a fuel cell since it would have provided a cathode material having coefficient of thermal expansion which closely matches the other components of the fuel cell decreased the internal resistance of the fuel cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP 2144.07.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1, 2 and 7 have been considered but are moot in view of the new ground(s) of rejection.

The prior art of record clearly teaches the same cathode, interlayer, electrolyte and anode structure.

The differences lie in the particular materials recited in the claims.

However it is held that the selection of such materials are well known to one of ordinary skill in the art as set forth above and thus obvious to replace the particular compositions of DE '132 with alternatively recognized electrode and electrolyte materials.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



gc  
May 30, 2006

Gregg Cantelmo  
Primary Examiner  
Art Unit 1745